

Application No.: 10/024,379
Amendment Dated: July 31, 2003
Reply to Office Action of: May 2, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

--1. (Currently Amended) A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

- a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 6, PA polyamide 66, PA polyamide 6/66 and a mixture thereof;
- b) from 0.05 to 100 parts by weight of a polyamine-polyamide copolymer prepared from the following monomers:
- α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight M_n of at least 146 g/mol, and
 - β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and
- c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 11, PA polyamide 12, PA polyamide 612, PA polyamide 1012, PA polyamide 1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of caprolactam and/or from, a combination of hexamethylenediamine/adipic acid and mixtures thereof; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of ω -amino-undecanoic acid, laurolactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, ~~and/or~~ a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid, and mixtures thereof.

2. (Currently Amended) The composite according to Claim 1, wherein the molding composition of layer I comprises:

a member selected from the group consisting of at least 0.5 part by weight of component a) ~~and/or~~, at least 0.5 part by weight of component b) ~~and/or~~, at least 0.5 part by weight of component c) and mixtures thereof.

3. (Currently Amended) The composite according to Claim 1, wherein the molding composition of layer I comprises:

a member selected from the group consisting of at least 10 parts by weight of component a) ~~and/or~~, at least 2 parts by weight of component b) ~~and/or~~, at least 10 parts by weight of component c), and mixtures thereof.

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4. (Currently Amended) The composite according to Claim 1, wherein the molding composition of layer I comprises:

a member selected from the group consisting of at least 20 parts by weight of component a) ~~and/or~~, at least 5 parts by weight of component b) ~~and/or~~, at least 20 parts by weight of component c), and mixtures thereof.

5. (Currently Amended) The composite according to Claim 1, wherein the molding composition of layer I comprises:

a member selected from the group consisting of at least 30 parts by weight of component a) ~~and/or~~, at least 10 parts by weight of component b) ~~and/or~~, at least 30 parts by weight of component c), and mixtures thereof.

6. (Original) The composite according to Claim 1, wherein the molding composition of layer I comprises at most 70 parts by weight of component a) or at most 80 parts by weight of component b) or at most 70 parts by weight of component c).

7. (Original) The composite according to Claim 1, wherein the molding composition of layer I comprises at most 60 parts by weight of component a) or at most 60 parts by weight of component b) or at most 60 parts by weight of component c).

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8. (Original) The composite according to Claim 1, wherein the molding composition of layer I has not more than 40 parts by weight of component b).

9. (Original) The composite according to Claim 1, wherein the polyamine-polyamide copolymer is obtained from 1 to 20% by weight of the polyamine.

10. (Original) The composite according to Claim 1, wherein the polyamine contains at least 8 nitrogen atoms.

11. (Original) The composite according to Claim 1, wherein the polyamine has a number- average molecular weight M_n of at least 500 g/mol.

12. (Original) The composite according to Claim 1, wherein the amino group concentration in the polyamine-polyamide copolymer is in the range from 100 to 2 500 mmol/kg.


13. (Original) The composite according to Claim 1, wherein the molding composition of layer I comprises a block copolymer formed from components a) and c).

14. (Currently Amended) The composite according to Claim 1, wherein the composite comprises at least one layer II obtained from a molding composition based on a

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member selected from the group consisting of PA polyamide 11, PA polyamide 12, PA polyamide 612, PA polyamide 1012, and/or PA polyamide 1212, and mixtures thereof.

15. (Currently Amended) The composite according to Claim 1, wherein the composite comprises at least one layer III obtained from a molding composition based a member selected from the group consisting of on PA polyamide 6, PA polyamide 66, and/or PA polyamide 6/66, and mixtures thereof.

 16. (Original) The composite according to Claim 15, wherein the composite has the layer sequence I/III.

17. (Original) The composite according to Claims 14 or 15, wherein the composite has the layer sequence II/I/III.

18. (Original) The composite according to Claims 14 or 15, wherein the composite has a symmetrical structure and either has the layer sequence II/I/II or has the layer sequence II/I/III/I/II.

19. (Original) The composite according to Claim 1, wherein the composite also comprises a regrind layer.

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20. (Original) The composite according to Claim 1, wherein the molding composition comprises not more than 50% by weight of an additive.

21. (Original) The composite according to Claim 13, wherein the layer II is the outer layer.

22. (Original) The composite according to Claim 1, wherein one of the layers is electrically conductive.

23. (Currently Amended) The composite according to Claim 1, comprising wherein an ~~additional,~~ internal electrically conductive layer ~~is adjacent to an innermost layer.~~

24. (Original) The composite according to Claim 1, wherein the composite is a tube.

25. (Original) The composite according to Claim 24, wherein at least one region of the composite is corrugated.

26. (Original) The composite according to Claim 1, wherein the composite is a hollow article.

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27. (Currently Amended) The composite according to Claim 1, comprising wherein an elastomer layer is adjacent to [the] an outermost layer.

28. (Original) The composite according to Claim 1, wherein the composite is a fuel piping, a brake-fluid piping, a coolant piping, a hydraulic-fluid piping, a fuel-pump piping, an air- conditioner piping, or a vapor line.

29. (Original) The composite according to Claims 26 or 27, wherein the composite is a container, or a filler pipe.

30. (Original) The composite according to Claim 1, wherein the composite is a film.

31. (Original) The composite according to Claim 1, wherein the composite is produced by multicomponent injection molding, coextrusion or coextrusion blow molding.

32. (Currently Amended) A composite having two or more layers and comprising:
a layer I obtained from a molding composition comprising:

- a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 6, PA polyamide 66, PA polyamide 6/66 and a mixture thereof;

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b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer
prepared from the following monomers:

- α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight M_n of at least 146 g/mol, and
- β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 11, PA polyamide 12, PA polyamide 612, PA polyamide 1012, PA polyamide 1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of caprolactam and/or from, a combination of hexamethylenediamine/adipic acid and mixtures thereof; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of ω -amino-undecanoic acid, laurolactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic

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acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, ~~and/or~~ a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid, and mixtures thereof;

wherein the molding composition of layer I is obtained by subjecting a blend comprising polyamide a) and said polyamide c) to solid-phase post-condensation.

33. (Original) The composite according to Claim 32, wherein a temperature of said solid-phase post-condensation is from 140°C to about 5 K below a crystalline melting point T_m of the polyamides.

34. (Currently Amended) A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 6, PA polyamide 66, PA polyamide 6/66 and a mixture thereof;

b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer prepared from the following monomers:

α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight M_n of at least 146 g/mol, and

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β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of ~~PA~~ polyamide 11, PA polyamide 12, PA polyamide 612, PA polyamide 1012, PA polyamide 1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of caprolactam and/or from, a combination of hexamethylenediamine/adipic acid and mixtures thereof; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained ~~from~~ by reacting a member selected from the group consisting of ω -amino-undecanoic acid, laurolactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, and/or a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid, and mixtures thereof;

wherein either polyamide a) or c) contains an excess of amino end groups and the other polyamide contains an excess of carboxyl end groups.

35. (Currently Amended) A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

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a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 6, PA polyamide 66, PA polyamide 6/66 and a mixture thereof;

b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer prepared from the following monomers:

α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight M_n of at least 146 g/mol, and

β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA polyamide 11, PA polyamide 12, PA polyamide 612, PA polyamide 1012, PA polyamide 1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100; wherein at least 20 parts by weight of components a) and b) is a monomer unit

36. (Original) The composite according to Claim 35, wherein said reactive compound is selected from the group consisting of a bisoxazoline, a biscarbodiimide, a bismaleimide, a

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bisanhydride, a diisocyanate and a mixture thereof.

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BASIS FOR THE AMENDMENT

The Claims have been amended to conform to accepted U.S. claim format and to recite proper Markush language.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1-36 will now be active in this application.

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INTERVIEW SUMMARY

Applicants wish to thank Examiner Patterson for his helpful and courteous discussion with Applicants' Representative on June 5, 2003. During this discussion it was noted that the Examiner would consider the application more favorably if the claims are amended as shown in the Listing of the Claims. In regard to the provisional double-patenting rejections it was noted that the claims of U.S. 6,355,358 do not disclose or suggest that at least 20 parts by weight of components a) and b); and b) and c), respectively, are a monomer unit obtained by reacting the components set forth in the last two paragraphs of Claims 1, 32, 34 and 35.